

Assignments » Handin 1 » Trees and Forests

Exercise

You must hand in your own solution to the problem. To partially test this, your source code has to be unique compared to that of all other students. This can be easily achieved by writing your name in the author field. Identical submissions will be forwarded to Student Affairs and Programmes to be investigated for plagiarism.

This exercise is about modelling a small forest of trees. Each tree has an age, a heights, and also a growth rate. You have to do the following:

1. Create a class Tree in BlueJ (or your favorite code editor), and write your name after @author in the file. **This is important**, since it guarantees that your submitted solution is unique.
2. Add the following three private fields to the Tree class:
 - age of type int: the tree's age in years.
 - height of type double: the tree's height in meters.
 - growthPct of type double: the tree's growth per year as a percentage.
3. Create a constructor for the class Tree(double growthPct), taking a single parameter of type double. The constructor must set the initial height to be 0.25 meters, and the age to be 1 year, and the growth rate to be the parameter given to the constructor.
4. Create a public toString() method that returns a String with the format: "Tree(age = 1, height = 0.25)", where 1 and 0.25 are substituted with what the value of the corresponding fields are.
5. Create a public method void growOneYear(), which increases the age by one, and increases the height of the tree according to the formula $height * (1 + growthPct / 100)$.
6. Modify the growOneYear() method such that a tree will stop growing once it reaches a height of 20 meters.
7. Create a class Forest and write your name after @author in the file. **This is important**, since it guarantees that your submitted solution is unique.
8. Add three private fields tree1, tree2, tree3 all of type Tree to the Forest class.
9. Create a constructor for the class Forest that takes three parameters of type double. The constructor must initialize the three fields to Trees with growth rates given by the parameters.
10. Create a public toString() method that returns a String with the format: "Forest(Tree(age = 1, height = 0.25), Tree(age = 1, height = 0.25), Tree(age = 1, height = 0.25))", where the data reflects the actual state of each tree.
11. Create a growOneYear() method that causes all the trees in the forrest to grow by one year.

[Sample test data](#) - [click here](#).

Submit Solution

Language: Java 8 ▼

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Handin 1

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